

;%^STN;highlighton= ***;highlightoff=*** ;

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FILE 'WPIDS' ENTERED AT 19:34:51 ON 09 NOV 2004
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=> s pyruvate carboxylase
L1 9511 PYRUVATE CARBOXYLASE

=> s l1 (5a) aspart?
L2 190 L1 (5A) ASPART?

=> s l2 (5a) inhibit?
10 FILES SEARCHED...
L3 26 L2 (5A) INHIBIT?

=> dup rem l3
PROCESSING COMPLETED FOR L3
L4 10 DUP REM L3 (16 DUPLICATES REMOVED)

=> d 1-10

L4 ANSWER 1 OF 10 BIOTECHDS COPYRIGHT 2004 THE THOMSON CORP. on STN
DUPLICATE 1
AN 2002-16323 BIOTECHDS
TI Novel mutated, feedback resistant pyruvate carboxylase enzyme
polypeptide, useful for producing amino acids e.g. L-lysine, L-threonine,
L-glycine, L-glutamic acid, L-proline and L-methionine and L-isoleucine;
plasmid-mediated recombinant enzyme gene transfer and expression in
Corynebacterium sp.
AU HANKE P D
PA ARCHER-DANIELS MIDLAND CO
PI WO 2002031158 18 Apr 2002
AI WO 2000-US31893 13 Oct 2000
PRAI US 2000-239913 13 Oct 2000
DT Patent
LA English
OS WPI: 2002-463267 [49]

L4 ANSWER 2 OF 10 MEDLINE on STN DUPLICATE 2
AN 2002646773 MEDLINE
DN PubMed ID: 12406733
TI Effect of pyruvate carboxylase overexpression on the physiology of
Corynebacterium glutamicum.
AU Koffas Mattheos A G; Jung Gyoo Yeol; Aon Juan C; Stephanopoulos Gregory
CS Department of Chemical Engineering, Massachusetts Institute of Technology,
Cambridge, Massachusetts 02139, USA.
SO Applied and environmental microbiology, (2002 Nov) 68 (11) 5422-8.
Journal code: 7605801. ISSN: 0099-2240.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200212
ED Entered STN: 20021031
Last Updated on STN: 20021218
Entered Medline: 20021217

L4 ANSWER 3 OF 10 WPIDS COPYRIGHT 2004 THE THOMSON CORP on STN
AN 1995-106843 [14] WPIDS
DNC C1995-048689
TI Variant of phospho-enol ***pyruvate*** ***carboxylase*** - not
substantially ***inhibited*** by ***aspartic*** acid, is used for
efficient production of amino acids.
DC B04 B05 D16 E19
IN IZUI, K; MATSUI, H; SUGIMOTO, M; SUZUKI, T; HIROSHI, M; MASAKAZU, S;
TOMOKO, S; TOYAMA, T; MATSUI, H H
PA (AJIN) AJINOMOTO KK
CYC 32
PI WO 9506114 A1 19950302 (199514)* JA 77 C12N009-88
RW: AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE
W: AU BR CA CN CZ HU KR PL RU SK US VN
AU 9480991 A 19950321 (199526) C12N009-88
JP 07111890 A 19950502 (199526) 16 C12N009-00
JP 08070860 A 19960319 (199621) 26 C12N009-00
CZ 9600524 A3 19960612 (199631) C12N009-88
EP 723011 A1 19960724 (199634) EN 50 C12N009-88
R: AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE
SK 9600204 A3 19961106 (199702) C12N009-88
BR 9407625 A 19970121 (199710) C12N009-88
AU 682547 B 19971009 (199749) C12N009-88
CN 1133615 A 19961016 (199802) C12N009-88
EP 723011 A4 19970101 (199841) C12N009-88
US 5876983 A 19990302 (199916) C12P013-04
US 5919694 A 19990706 (199933) C07H021-04
JP 3013711 B2 20000228 (200015) 16 C12N009-00
RU 2133772 C1 19990727 (200030) C12N009-88
MX 195842 B 20000404 (200124) C07H021-004
HU 219600 B 20010528 (200140) C12N009-88
CZ 289051 B6 20011017 (200172) C12N009-88
EP 723011 B1 20020703 (200243) EN C12N009-88
R: AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE
DE 69430919 E 20020808 (200259) C12N009-88
KR 337959 B 20021123 (200333) C12N009-88
SK 283369 B6 20030603 (200345) C12N009-88
PH 1199448842 B1 20020416 (200382) C12N015-00
ADT WO 9506114 A1 WO 1994-JP1365 19940817; AU 9480991 A AU 1994-80991
19940817; JP 07111890 A JP 1994-196777 19940822; JP 08070860 A JP
1994-196778 19940822; CZ 9600524 A3 CZ 1996-524 19940817; EP 723011 A1 EP
1994-924384 19940817, WO 1994-JP1365 19940817; SK 9600204 A3 WO
1994-JP1365 19940817, SK 1996-204 19940817; BR 9407625 A BR 1994-7625
19940817, WO 1994-JP1365 19940817; AU 682547 B AU 1994-80991 19940817; CN
1133615 A CN 1994-193905 19940817; EP 723011 A4 EP 1994-924384 19940817;
US 5876983 A WO 1994-JP1365 19940817, US 1996-596366 19960429; US 5919694
A Div ex WO 1994-JP1365 19940817, Div ex US 1996-596366 19960429, US
1997-967104 19971110; JP 3013711 B2 JP 1994-196777 19940822; RU 2133772 C1
WO 1994-JP1365 19940817, RU 1996-107112 19940817; MX 195842 B MX 1994-6418
19940823; HU 219600 B WO 1994-JP1365 19940817, HU 1996-240 19940817; CZ
289051 B6 WO 1994-JP1365 19940817, CZ 1996-524 19940817; EP 723011 B1 EP
1994-924384 19940817, WO 1994-JP1365 19940817; DE 69430919 E DE
1994-630919 19940817, EP 1994-924384 19940817, WO 1994-JP1365 19940817; KR
337959 B WO 1994-JP1365 19940817, KR 1996-700741 19960214; SK 283369 B6 WO
1994-JP1365 19940817, SK 1996-204 19940817; PH 1199448842 B1 PH 1994-48842
19940823
FDT AU 9480991 A Based on WO 9506114; EP 723011 A1 Based on WO 9506114; BR
9407625 A Based on WO 9506114; AU 682547 B Previous Publ. AU 9480991,
Based on WO 9506114; US 5876983 A Based on WO 9506114; JP 3013711 B2
Previous Publ. JP 07111890; RU 2133772 C1 Based on WO 9506114; HU 219600 B
Previous Publ. HU 73690, Based on WO 9506114; CZ 289051 B6 Previous Publ.
CZ 9600524, Based on WO 9506114; EP 723011 B1 Based on WO 9506114; DE
69430919 E Based on EP 723011, Based on WO 9506114; KR 337959 B Previous
Publ. KR 96704029, Based on WO 9506114; SK 283369 B6 Previous Publ. SK
9600204, Based on WO 9506114
PRAI JP 1993-209775 19930824; JP 1993-209776 19930824;
JP 1994-153876 19940705
IC ICM C07H021-004; C07H021-04; C12N009-00; C12N009-88; C12N015-00;
C12P013-04
ICS C12N001-020; C12N001-20; C12N001-21; C12N009-18; C12N015-03;
C12N015-11; C12N015-52; C12P013-06; C12P013-08; C12P013-10;
C12P013-12; C12P013-14; C12P013-24
ICA C12N015-09
ICI C12N001-21, C12R001:01; C12N001-21, C12R001:185; C12N009-00, C12R001:01;
C12N009-00, C12R001:185; C12P013-06, C12R001:185; C12P013-06,

C12R001:01; C12P013-08, C12R001:185; C12P013-08, C12R001:01;
 C12P013-10, C12R001:185; C12P013-10, C12R001:01; C12P013-12,
 C12R001:185; C12P013-14, C12R001:185; C12P013-14, C12R001:01;
 C12P013-24, C12R001:185; C12P013-24, C12R001:01; C12N009-00,
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 C12N001-21, C12R001:01; C12N015-09, C12R001:185; C12P013-06,
 C12R001:185; C12P013-06, C12R001:01; C12P013-08, C12R001:185;
 C12P013-08, C12R001:01; C12N009-00, C12R001:185; C12N009-00,
 C12R001:01; C12N015-09, C12R001:185

L4 ANSWER 4 OF 10 MEDLINE on STN DUPLICATE 3
 AN 89374349 MEDLINE
 DN PubMed ID: 2775312
 TI Potentiation of benzoate toxicity by glyoxylate. Inhibition of pyruvate
 carboxylase and the urea cycle.
 AU Cyr D M; Tremblay G C
 CS Department of Biochemistry and Biophysics, University of Rhode Island,
 Kingston 02881.
 NC DK33536 (NIDDK)
 SO Biochemical pharmacology, (1989 Sep 1) 38 (17) 2919-23.
 Journal code: 0101032. ISSN: 0006-2952.
 CY ENGLAND: United Kingdom
 DT Journal; Article; (JOURNAL ARTICLE)
 LA English
 FS Priority Journals
 EM 198909
 ED Entered STN: 19900309
 Last Updated on STN: 19990129
 Entered Medline: 19890927

L4 ANSWER 5 OF 10 MEDLINE on STN DUPLICATE 4
 AN 88139221 MEDLINE
 DN PubMed ID: 3325498
 TI Regulation of reductive production of succinate under anaerobic conditions
 in baker's yeast.
 AU Muratsubaki H
 CS Department of Clinical Biochemistry, Faculty of Health Science, Kyorin
 University, Tokyo.
 SO Journal of biochemistry, (1987 Oct) 102 (4) 705-14.
 Journal code: 0376600. ISSN: 0021-924X.
 CY Japan
 DT Journal; Article; (JOURNAL ARTICLE)
 LA English
 FS Priority Journals
 EM 198803
 ED Entered STN: 19900308
 Last Updated on STN: 19900308
 Entered Medline: 19880325

L4 ANSWER 6 OF 10 MEDLINE on STN DUPLICATE 5
 AN 86164336 MEDLINE
 DN PubMed ID: 3514213
 TI Pyruvate carboxylase from *Saccharomyces cerevisiae*. Quaternary structure,
 effects of allosteric ligands and binding of avidin.
 AU Rohde M; Lim F; Wallace J C
 SO European journal of biochemistry / FEBS, (1986 Apr 1) 156 (1) 15-22.
 Journal code: 0107600. ISSN: 0014-2956.
 CY GERMANY, WEST: Germany, Federal Republic of
 DT Journal; Article; (JOURNAL ARTICLE)
 LA English
 FS Priority Journals
 EM 198605
 ED Entered STN: 19900321
 Last Updated on STN: 19900321
 Entered Medline: 19860519

L4 ANSWER 7 OF 10 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on
 STN
 AN 1982:255011 BIOSIS
 DN PREV198274027491; BA74:27491
 TI EFFECT OF SALT STRESS ON THE STRUCTURE AND CARBON FLOW MECHANISM IN A
 NOXIOUS WEED PARTHENIUM-HYSTEROPHORUS.
 AU HEGDE B A [Reprint author]; PATIL T M
 CS DEP BOTANY, SHIVAJI UNIV, KOLHAPUR 416004, INDIA
 SO Weed Research, (1982) Vol. 22, No. 1, pp. 51-56.
 CODEN: WEREAT. ISSN: 0043-1737.

DT Article
FS BA
LA ENGLISH

L4 ANSWER 8 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1971:506589 HCAPLUS
DN 75:106589
TI Reaction mechanism and regulation of pyruvate carboxylase in *Penicillium camemberti*
AU Stan, H. J.
CS Inst. Lebensmittelchem. Lebensmitteltechnol., Tech. Uni., Berlin, Fed. Rep. Ger.
SO Ernährungs-Umschau (1971), 18(6), 257-8
CODEN: ERUMAT; ISSN: 0174-0008
DT Journal
LA German

L4 ANSWER 9 OF 10 MEDLINE on STN
AN 67178602 MEDLINE
DN PubMed ID: 5970498
TI ***Inhibition*** of yeast ***pyruvate*** ***carboxylase*** by L- ***aspartate*** and oxaloacetate.
AU Palacian E; de Torriontegui G; Losada M
SO Biochemical and biophysical research communications, (1966 Sep 8) 22 (5) 644-9.
Journal code: 0372516. ISSN: 0006-291X.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 196709
ED Entered STN: 19900101
Last Updated on STN: 19970203
Entered Medline: 19670907

L4 ANSWER 10 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1966:484246 HCAPLUS
DN 65:84246
OREF 65:15824f-g
TI ***Inhibition*** of yeast ***pyruvate*** ***carboxylase*** by L- ***aspartate*** and oxaloacetate
AU Palacian, E.; de Torriontegui, G.; Losada, M.
CS Inst. Biol. Celular, Madrid
SO Biochemical and Biophysical Research Communications (1966), 24(5), 644-9
CODEN: BBRCA9; ISSN: 0006-291X
DT Journal
LA English

=> d 9, 10 ab

L4 ANSWER 9 OF 10 MEDLINE on STN

L4 ANSWER 10 OF 10 HCAPLUS COPYRIGHT 2004 ACS on STN
AB L-Aspartate (noncompetitively) and oxaloacetate (competitively) inhibited bakers' yeast pyruvate carboxylase. Since the oxaloacetate formed by the carboxylation of pyruvate in yeast can be removed for the synthesis of aspartate, pyruvate carboxylase can be regarded as the 1st enzyme of the pathway leading from pyruvate to aspartate. The ***inhibition*** of ***pyruvate*** ***carboxylase*** activity by L- ***aspartate*** might be considered an allosteric ***inhibition*** by end-product, and might be important in the regulation of the oxaloacetate level within the cell.

=> dis his

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FILE 'MEDLINE, SCISEARCH, LIFESCI, BIOTECHDS, BIOSIS, EMBASE, HCAPLUS, NTIS, ESBIODBASE, BIOTECHNO, WPIDS' ENTERED AT 19:34:51 ON 09 NOV 2004

L1 9511 S PYRUVATE CARBOXYLASE
L2 190 S L1 (5A) ASPART?
L3 26 S L2 (5A) INHIBIT?
L4 10 DUP REM L3 (16 DUPLICATES REMOVED)

=> log h
COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
27.37	27.58

FULL ESTIMATED COST

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE	TOTAL
ENTRY	SESSION
-0.70	-0.70

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DATE: Tuesday, November 09, 2004

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		<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L3	L2 with inhibition	11
<input type="checkbox"/>	L2	L1 with aspart\$	180
<input type="checkbox"/>	L1	pyruvate carboxylase	908

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☐ 1. Document ID: US 20030103935 A1

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L3: Entry 1 of 11

File: PGPB

Jun 5, 2003

PGPUB-DOCUMENT-NUMBER: 20030103935

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030103935 A1

TITLE: Soluble variants of type I membrane proteins, and methods of using them

PUBLICATION-DATE: June 5, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Linnenbach, Alban J.	Philadelphia	PA	US	
Koprowski, Hilary	Wynnewood	PA	US	
Herlyn, Dorothee	Wynnewood	PA	US	

US-CL-CURRENT: [424/85.1](#); [424/185.1](#), [424/85.2](#), [424/85.4](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Da
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☐ 2. Document ID: US 20030087381 A1

L3: Entry 2 of 11

File: PGPB

May 8, 2003

PGPUB-DOCUMENT-NUMBER: 20030087381

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030087381 A1

TITLE: Metabolically engineered organisms for enhanced production of oxaloacetate-derived biochemicals

PUBLICATION-DATE: May 8, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Gokarn, Ravi R.	Plymouth	MN	US	
Eiteman, Mark A.	Athens	GA	US	
Altman, Elliot	Athens	GA	US	

US-CL-CURRENT: [435/69.1](#); [435/193](#), [435/252.3](#), [435/252.33](#), [435/320.1](#), [536/23.2](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 3. Document ID: US 20020177202 A1

L3: Entry 3 of 11

File: PGPB

Nov 28, 2002

PGPUB-DOCUMENT-NUMBER: 20020177202

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020177202 A1

TITLE: Feedback-resistant pyruvate carboxylase gene from corynebacterium

PUBLICATION-DATE: November 28, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Hanke, Paul D.	Aurora	IL	US	

US-CL-CURRENT: [435/189](#); [435/193](#), [435/320.1](#), [435/325](#), [435/69.1](#), [536/23.2](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 4. Document ID: US 6645498 B1

L3: Entry 4 of 11

File: USPT

Nov 11, 2003

US-PAT-NO: 6645498

DOCUMENT-IDENTIFIER: US 6645498 B1

TITLE: Soluble variants of type I membrane proteins, and methods of using them

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 5. Document ID: US 6455284 B1

L3: Entry 5 of 11

File: USPT

Sep 24, 2002

US-PAT-NO: 6455284

DOCUMENT-IDENTIFIER: US 6455284 B1

TITLE: Metabolically engineered E. coli for enhanced production of oxaloacetate-derived biochemicals

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 6. Document ID: US 5766925 A

L3: Entry 6 of 11

File: USPT

Jun 16, 1998

US-PAT-NO: 5766925

DOCUMENT-IDENTIFIER: US 5766925 A

TITLE: Method of producing L-lysine

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw De
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☐ 7. Document ID: US 5279942 A

L3: Entry 7 of 11

File: USPT

Jan 18, 1994

US-PAT-NO: 5279942

DOCUMENT-IDENTIFIER: US 5279942 A

TITLE: Detection of pregnancy by identification of the C peptide of relaxin in body fluids of animals

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw De
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☐ 8. Document ID: US 5120660 A

L3: Entry 8 of 11

File: USPT

Jun 9, 1992

US-PAT-NO: 5120660

DOCUMENT-IDENTIFIER: US 5120660 A

TITLE: Method for canine fertility detection

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw De
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☐ 9. Document ID: US 5089419 A

L3: Entry 9 of 11

File: USPT

Feb 18, 1992

US-PAT-NO: 5089419

DOCUMENT-IDENTIFIER: US 5089419 A

TITLE: Detection of pregnancy by identification of the C peptide of relaxin in the urine of animals

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw De
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☐ 10. Document ID: BR 200114532 A, WO 200231158 A2, AU 200213146 A, US 20020177202 A1, EP 1325135 A2

L3: Entry 10 of 11

File: DWPI

Dec 30, 2003

DERWENT-ACC-NO: 2002-463267

DERWENT-WEEK: 200409

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TITLE: Novel mutated, feedback resistant pyruvate carboxylase enzyme polypeptide, useful for producing amino acids e.g. L-lysine, L-threonine, L-glycine, L-glutamic acid, L-proline and L-methionine and L-isoleucine

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw Ds
------	-------	----------	-------	--------	----------------	------	-----------	--	--	--------	------	---------

Clear	Generate Collection	Print	Fwd Refs	Bkwd Refs	Generate OACS
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Terms	Documents
L2 with inhibition	11

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Search Results - Record(s) 11 through 11 of 11 returned.

☐ 11. Document ID: PH 1199448842 B1, WO 9506114 A1, AU 9480991 A, JP 07111890 A, JP 08070860 A, CZ 9600524 A3, EP 723011 A1, SK 9600204 A3, BR 9407625 A, AU 682547 B, CN 1133615 A, EP 723011 A4, US 5876983 A, US 5919694 A, JP 3013711 B2, RU 2133772 C1, MX 195842 B, HU 219600 B, CZ 289051 B6, EP 723011 B1, DE 69430919 E, KR 337959 B, SK 283369 B6

Using default format because multiple data bases are involved.

L3: Entry 11 of 11

File: DWPI

Apr 16, 2002

DERWENT-ACC-NO: 1995-106843

DERWENT-WEEK: 200382

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TITLE: Variant of phospho-enol pyruvate carboxylase - not substantially inhibited by aspartic acid, is used for efficient production of amino acids

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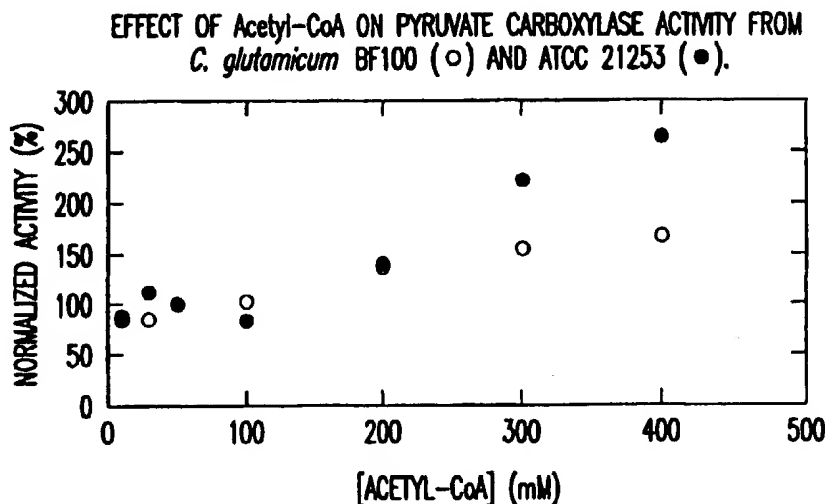
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(54) Title: FEEDBACK-RESISTANT PYRUVATE CARBOXYLASE GENE FROM CORYNEBACTERIUM



(57) Abstract: The present invention relates to a mutated pyruvate carboxylase gene from *Corynebacterium*. The mutant pyruvate carboxylase gene encodes a pyruvate carboxylase enzyme which is resistant to feedback inhibition from aspartic acid. The present invention also relates to a method of replacing the wild-type pyruvate carboxylase gene in *Corynebacterium* with this feedback-resistant pyruvate carboxylase gene. The present invention further relates to methods of the production of amino acids, preferably lysine, comprising the use of this mutant pyruvate carboxylase enzyme in microorganisms.